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Technical Report Week 10

Introduction: Learning how to manipulate, tidy, and analyze data is extremely important in any sort of data-driven field. In GIS, we deal with two types of data: vector data and raster data. Dealing with raster data is very different than handling vector data and requires its own set of separate tools. This week, we will use several raster processing tools to determine which areas of Highway 22 and Highway 33 between the towns of Victor, Idaho and Wilson, Wyoming are at most risk of an avalanche and decide which state should receive more funding for avalanche prevention and road repair.

Data Used (where to download): <https://apps.nationalmap.gov/downloader/#/>

<https://www.mrlc.gov/data>

Methods: I found and downloaded the DEMs from the national map website. I then added those to the map and used the mosaic tool to create a single DEM that represented values equally. I then used the slope, aspect, and raster calculator tools to determine which areas met the criteria of being either barren or shrub/scrub covered land, had a slope of between 32 and 50 degrees, and either faces North, Northeast, South, or Southeast. I found the road catalog and edited the road to just be the parts of the highway between Victor and Wilson. I then used the stack profile tool to create a chart calculating the elevation and distance of each road. Then I created a new feature class of the pass of the peak and used the viewshed tool to determine which areas can be “shot down”.

Conclusion: From what I calculated, there is a larger portion of Highway 22 located within the mountain pass, several parts more of the road that are susceptible to avalanche damage, and reach higher elevations. For this reason, Wyoming should be allocated more of the funds. The portion of the road that is within Idaho (Highway 33) doesn’t reach very high elevation and is less than half the distance than the portion of the road that goes through Wyoming. I do believe my results make sense, although the only thing I would change is calculating the geometry for the distance of the road before I did used the stack profile tool, just so I could’ve also included the units of measurement on my graph to communicate my message clearer. I think it’s alright my graph doesn’t include that because I’m using it to compare the two roads, and I feel like it achieves its purpose.

Map:

